

What is claimed is:

1. An automated means for storing, dispensing and orienting injectable drug vials for a robotic application comprising:

a robotic vial gripper device for holding and transferring one vial from one station to a next station of the robotic application; and

a detector that determines whether the vial is in a correct orientation throughout one or more stations of the robotic application.

2. The automated means of claim 1, wherein the robotic application comprises an automated medication preparation system including automated syringe preparation including reconstitution of the medication and delivery of the reconstituted medication to a syringe.

3. The automated means of claim 1, wherein the detector determines whether the vial is an upright position or is in an opposite downright position relative to ground.

4. The automated means of claim 1, wherein the vial includes a magnetic chip attached thereto at one end and the detector comprises a detector that is capable of detecting a change in a surrounding magnetic field such that when the vial is in a correct

orientation, the magnetic chip of the vial influences the detector and causes it to generate a control signal indicating that the vial is in the correct orientation and can be advanced to a next station.

5. The automated means of claim 1, wherein the vial includes an optical marker and the detector comprises an optical detector that is capable of detecting the optical marker such that when the vial is in a correct orientation, the detector recognizes the optical marker of the vial and generates a control signal that indicates that the vial is in the correct orientation and can be advanced to a next station.

6. The automated means of claim 1, wherein the detector is positioned at a location prior to a station where medication contained in the vial is reconstituted using a cannula unit that includes a cannula extending therefrom that pierces a septum of a decapped vial.

7. The automated means of claim 1, wherein if the vial is not in a correct orientation, the detector sends a control signal that causes the vial to be removed from the robotic application;

8. The automated means of claim 1, wherein the detector is present at a station where the vial is placed on a rotatable pedestal and is positively identified by scanning equipment, the detector serving to determine whether the vial is placed upright on the pedestal

prior to the vial gripper device engaging and removing the vial therefrom for delivery to the next station.

9. The automated means of claim 1, wherein a cap end of the vial includes a member attached thereto, the detector being configured and positioned so that when the vial is properly orientated, the member lies within a scope of field of the detector and the detector detects the member and generates a control signal indicating that the vial is properly orientated and should be advanced to a next station.

10. The automated means of claim 9, wherein the member comprises an optical marker.

11. The automated means of claim 9, wherein the member comprises a magnetic chip.

12. The automated means of claim 9, wherein the member is a scannable tag attached to the vial and the detector is a reader such that if and when the scannable tag passes through a beam of the detector, the detector reads the tag and generates a control signal indicating that the vial is in the proper orientation and should be advanced to the next station.

13. An automated medication preparation system including automated syringe preparation in which medication contained in an injectable drug vial is delivered in a

prescribed dosage amount to a syringe, the system comprising:

a robotic vial gripper device for capturing the injectable drug vial from a drug storage area and delivering it to one or more vial processing stations;

an automated device associated with a fluid transfer station for delivering a prescribed dosage amount of medication from the vial to the syringe through an uncapped barrel thereof in a just-in-time for use manner, the fluid transfer station being located downstream of the vial processing stations; and

a detector for determining whether the vial is in a correct orientation prior to the vial being delivered to the fluid transfer station by the robotic vial gripper device.

14. The automated system of claim 3, wherein the detector determines whether the vial is in an upright position or is in an opposite downright position relative to ground.

15. The automated system of claim 13, wherein the vial includes a magnetic chip attached thereto at one end and the detector comprises a detector that is capable of detecting a change in a surrounding magnetic field such that when the vial is in a correct orientation, the magnetic chip of the vial influences the detector and causes it to generate a control signal indicating that the vial is in the correct orientation and can be advanced to a next station.

16. The automated system of claim 13, wherein the vial includes an optical marker and the detector comprises an optical detector that is capable of detecting the optical

marker such that when the vial is in a correct orientation, the detector recognizes the optical marker of the vial and generates a control signal that indicates that the vial is in the correct orientation and can be advanced to a next station.

17. The automated system of claim 13, wherein if the vial is not in a correct orientation, the detector sends a control signal that causes the vial to be removed from a current station where the vial is located.

18. The automated system of claim 13, wherein the detector is present at a station where the vial is placed on a rotatable pedestal and is positively identified by scanning equipment, the detector serving to determine whether the vial is placed upright on the pedestal prior to the vial gripper device engaging and removing the vial therefrom for delivery to the next station.

19. The automated system of claim 13, wherein a cap end of the vial includes a member attached thereto, the detector being configured and positioned so that when the vial is properly orientated, the member lies within a scope of field of the detector and the detector detects the member and generates a control signal indicating that the vial is properly orientated and should be advanced to a next station.

20. The automated system of claim 19, wherein the member comprises an optical marker.

21. The automated system of claim 19, wherein the member comprises a magnetic chip.

22. The automated system of claim 19, wherein the member is a scannable tag attached to the vial and the detector is a reader such that if and when the scannable tag passes through a beam of the detector, the detector reads the tag and generates a control signal indicating that the vial is in the proper orientation and should be advanced to the next station.

23. A method for handling
retrieving one vial from a source;
transferring the vial from one station to a next station of the robotic application
with an automated robotic vial gripper device;
detecting whether the vial is in a correct orientation throughout one or more
stations of the robotic application; and
generating a control signal instructing the vial to be advanced to the next station
if the vial is detected as being in the proper orientation.

24. The method of claim 23, wherein the robotic application comprises an automated medication preparation system including automated syringe preparation including reconstitution of the medication and delivery of the reconstituted medication to a syringe.

25. The method of claim 23, further including the step of:

discarding the vial if after a predetermined time period, the vial is not detected as being in the proper orientation.

26. The method of claim 23, wherein the step of detecting whether the vial is in the correct orientation includes the step of:

determining whether the vial is in an upright position or is in an opposite downright position relative to ground.

27. The method of claim 23, wherein the step of detecting whether the vial is in the correct orientation includes the step of:

detecting a change in a magnetic field surrounding the detector such that when the vial is in a correct orientation, a magnetic chip attached to the vial influences the detector and causes it to generate a control signal indicating that the vial is in the correct orientation and can be advanced to a next station.

28. The method of claim 23, wherein the step of detecting whether the vial is in the correct orientation includes the step of:

optically detecting a marker that is attached to the vial such that when the vial is in a correct orientation, the detector reads the optical marker of the vial and generates a control signal that indicates that the vial is in the correct orientation and can be advanced to a next station.

29. The method of claim 23, wherein the step of detecting whether the vial is in the correct orientation includes the step of:

reading a scannable tag that is attached to the vial such that when the vial is in a correct orientation, the detector scans and reads the tag of the vial and generates a control signal that indicates that the vial is in the correct orientation and can be advanced to a next station.